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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,674	10/19/2001	Yan Zhou	021040-000300US	3848

7590 10/19/2004
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EXAMINER

PETKOVSEK, DANIEL J

ART UNIT PAPER NUMBER

2874

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,674

Applicant(s)

ZHOU ET AL.

Examiner

Daniel J Petkovsek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment received August 16, 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-95 is/are pending in the application.
- 4a) Of the above claim(s) 1-36 and 47-95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the amendment/response received August 16, 2004. In accordance with the amendment, new drawings have been received, and arguments presented to rejected claims 37-46.

Drawings

1. The drawings were received on August 16, 2004. These drawings are acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 37, 38, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Hornbeck et al. U.S.P. No. 6,775,453.

Hornbeck et al. U.S.P. No. 6,775,453 teaches (Fig. 10, column 9, line 66, through column 10, line 63) an optical waveguide 20 comprising: a substrate 24, a lower cladding 26, a non-cylindrical waveguide core 60, and an upper cladding 26, the waveguide core 60 having a refractive index that is graded in the y-coordinate and gradually decreases from a maximum effective refractive index at the core's center 32 (see column 10, lines 1-16), which clearly, fully meets Applicant's claimed limitations. Regarding claims 38

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and 40, the refractive index is also graded in the x-coordinate, having a maximum refractive index at the core 32 and gradually decreasing outward.

4. Claims 42, 44, and 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Song et al. U.S.P. No. 6,339,667.

Song et al. U.S.P. No. 6,339,667 teaches (Fig. 2, column 3, lines 23-47) an optical waveguide 10 comprising: a substrate 210, a lower waveguide cladding 220, a non-cylindrical core 230, an upper waveguide cladding (i.e. air or any layer above core), the refractive index in the core being constant in both x and y coordinates, which clearly, fully meets Applicant's claimed limitations. It is noted that air constitutes a cladding, assuming the core is open.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 42, 44, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. U.S.P. No. 6,339,667.

Song et al. U.S.P. No. 6,339,667 teaches (Fig. 2, column 3, lines 23-47) an optical waveguide 10 comprising: a substrate 210, a lower waveguide cladding 220, and a non-cylindrical core 230, the refractive index in the core being constant in both x and y coordinates. Song et al. '667 does not *explicitly* teach an upper cladding. It is well known in the art to use cladding layers around and above the core material of a waveguide for the purpose of improving optical coupling performance. It would have

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been obvious at the time the invention was made to a person having ordinary skill in the art to use a cladding layer to confine the optical signal of Song et al. '667.

7. Claims 39, 41-43, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hornbeck et al. U.S.P. No. 6,775,453.

Hornbeck et al. U.S.P. No. 6,775,453 teaches (Fig. 10, column 9, line 66, through column 10, line 63) an optical waveguide 20 comprising: a substrate 24, a lower cladding 26, a non-cylindrical waveguide core 60, and an upper cladding 26, the waveguide core 60 having a refractive index that is graded in the x-coordinate and y-coordinate and gradually decreases from a maximum effective refractive index at the core's center 32 (see column 10, lines 1-16). Hornbeck et al. '453 does not explicitly teach different embodiments in which a certain coordinate (either x or y) is constant in effective refractive index through the entire coordinate direction, while the opposite coordinate (either y or x, respectively) is graded, gradually decreasing from a maximum effective refractive index at the core's center. It would have been an obvious matter of design choice to create a waveguide, based upon the explicit teaching of Hornbeck et al. '453, in which the refractive index was graded in either the x-coordinate or the y-coordinate, but not both, since the one-directional graded index does not solve any problem or is for any particular purpose and it appears that the invention would perform equally well (maintaining efficient propagation of the optical signal within the center of the waveguide core) with either embodiment, or the presently disclosed subject matter of Hornbeck et al. '453. Applicant is silent to the criticality of such.

Response to Arguments

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8. Applicant's arguments filed August 16, 2004 have been fully considered but they are not persuasive as to the matter of the 35 U.S.C. 102(e) rejections to Song et al. U.S.P. No. 6,339,667 to claims 42, 44, and 46. Applicant asserts that there is no explicit cladding. However, it is inherent that some material overlays the core region, be it air, or another cladding. Examiner has added a rejection to claims 42, 44, and 46 to Song et al. '667 under 35 U.S.C. 103 (a) to eliminate further issue.

9. Applicant's arguments, see response, filed August 16, 2004, with respect to the rejections of claims 37, 38, and 40 under Lee et al. U.S.P. No. 6,690,871 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of new art to Hornbeck et al. '453.

Conclusion

10. New grounds of rejection has been made under newly cited prior art. In accordance, this action has been made **NON-FINAL**.

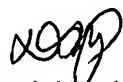
11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of optical waveguides including graded index properties: PTO-892 form reference 4,712,854 to Mikami et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

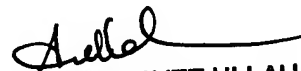
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Petkovsek
October 14, 2004



AKM ENAYET ULLAH
PRIMARY EXAMINER